BACKGROUND:
Heart disease is the leading cause of death in both men and women, accounting for nearly one-fourth of the deaths in the USA in 2010 [1]. Coronary heart disease (CHD) is the most common type of heart disease with about 715,000 heart attacks occurring in the United States each year. Startlingly, nearly 75% of these heart attacks are in those without known coronary disease [2]. Thus, primary prevention of CHD is often the responsibility of primary care physicians in the outpatient setting. In 2001, the Adult Treatment Panel III (ATPIII) published clinical guidelines to aid in the primary prevention of CHD [3]. A critical component of these guidelines is the use of the Framingham Risk Score (FRS) to guide treatment. Recent data have shown that improving cholesterol primarily through reductions in
LDL reduces CHD mortality [4]. Aspirin has also shown similar benefits in primary prevention [5]. We observed that the primary prevention of CHD in the outpatient internal medicine resident clinic at the University of Missouri Healthcare System (UMHC) was compromised by inadequate documentation of CHD risk factors and FRS. Further, we hypothesized that increasing the documentation of FRS would improve management of CHD and thereby prevent future coronary events.

**AIM:**
To increase the documentation of the 10-year Framingham Hard CHD Risk Score for patients in the outpatient internal medicine resident clinic at UMHC from 3% in December 2011 to 50% by December 2012.

**METHODS:**
Following approval from the UMHC institutional review board, we performed baseline data collection through a chart review of 60 random patients from the outpatient internal medicine resident clinic at UMHC. Charts were reviewed for documentation of CHD risk factors and FRS in the preceding twelve months. Patients without CHD or CHD risk equivalents, according to ATPIII, were categorized as primary prevention and all others were categorized as secondary prevention. We then reviewed for the percentage of patients undergoing lipid monitoring and percentage with LDL at goal, again according to ATPIII guidelines. We also examined for aspirin prophylaxis according to the US Preventative Services Task Force (USPSTF) guidelines. We compared the incidence of these endpoints between the primary prevention and secondary prevention groups. We then identified stakeholders utilizing fishbone diagramming and developed interventions utilizing effort/yield study [6]. Based on these studies, we implemented a multi-faceted intervention to increase the documentation of FRS [6]. We placed ATPIII Quick Desk Reference handouts at each physician cubicle in the resident clinic and performed serial educational seminars for all internal medicine resident physicians on appropriate use of ATPIII guidelines and documentation of FRS and treatments. Four months after our intervention, we conducted follow-up data collection on 60 random patients in an identical manner as our baseline data collection. After follow-up data collection, we compared incidences between the pre- and post-intervention primary prevention groups. Data for each endpoint were presented as percentage of patients from each group positive for variable in question. Statistical analyses of our baseline and follow-up data collections were done using chi-square test with p value <0.05 considered significant.

**RESULTS:**
Our baseline data collection revealed that only 3% of primary prevention patients had documentation of their FRS and only 18% of patients had their CHD risk factors documented. Further baseline data analysis revealed that primary prevention patients were significantly less likely than secondary prevention patients to have lipid monitoring performed, 59% versus 83% respectively. Additionally, the primary prevention group had significantly fewer patients with LDL at goal, 61% compared to 77% respectively. Finally, primary prevention patients were significantly less likely to be on appropriate aspirin prophylaxis with only 55% of the primary prevention group on appropriate aspirin prophylaxis compared to 87% of the secondary prevention group.

After our intervention, we found significant improvement in the documentation of FRS with an increase from 3% at baseline to 34% of patient charts having FRS documentation (p value <0.001).
Documentation of CHD risk factors also showed an increased trend from 18% to 37% but this difference did not achieve statistical significance (p value 0.07). Importantly, the percentage of primary prevention patients who underwent lipid monitoring increased significantly from 59% to 90% (p value <0.001). Percentage of patients with LDL at goal increased to 78% and appropriate aspirin prophylaxis increased to 76% but neither result achieved statistical significance.

**CONCLUSIONS:**
A quality improvement process to improve the primary prevention of CHD at the UMHC outpatient internal medicine resident clinic achieved a significant increase in FRS documentation through resident education and quick reference postings. This improvement significantly increased incidence of lipid monitoring and showed a trend towards increasing the percentage of patients with LDL at goal and on appropriate aspirin prophylaxis. Repeated cycles of quality improvement and hard changes to the electronic medical record are needed to achieve the stated goal of FRS documentation and significantly increase the adherence to ATPIII and USPSTF guidelines for CHD prevention.

**REFERENCES**

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**Case Report**
65-year-old male patient with left sided headache and orbital pain of 2-3 months duration

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**Introduction:**
Despite advancement of neurotechnology and neuroimaging, detailed history and examination remain the most important tools for diagnosis of unilateral headache and orbital pain. Headache is a common symptom among all age groups with a considerable array of differential diagnoses. Tolosa